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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/395,409	09/14/99	CANTOR	25491-2403D

HM12/1004
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EXAMINER

HOUTTEMAN, S

ART UNIT	PAPER NUMBER
1656	

DATE MAILED: 10/04/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/395,409

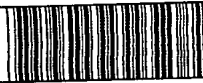
Applicant(s)

Cantor et al.

Examiner

Scott Houtteman

Group Art Unit
1656



☐ Responsive to communication(s) filed on _____

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire three month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim

- ☒ Claim(s) 1-87 _____ is/are pending in the application.
- Of the above, claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1-87 _____ is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claims _____ are subject to restriction or election requirement.

Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☐ All ☐ Some* ☒ None of the CERTIFIED copies of the priority documents have been
- ☐ received.
- ☐ received in Application No. (Series Code/Serial Number) _____.
- ☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

- ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- ☐ Notice of References Cited, PTO-892
- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 9/14/99
- ☐ Interview Summary, PTO-413
- ☒ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Khrapko et al., J. DNA Sequencing and Mapping 1:375-388, 1991 (Khrapko) in view of Drmanac et al., DNA and Cell Biology 9(7):527-534, 1990 (Drmanac).

Claims 1-87 are drawn to methods of sequencing, sequencing systems and products (kits and arrays) used in these methods. The methods comprise nucleic acids having a single stranded region comprising a variable, or random region. The claims are not limited to any specific length of constant and random regions nor any minimum number of probes. Thus, these claims read on the use of as few as two probes of any length having a variable region of a single nucleotide.

Khrapko teaches the use of a probe array comprising a constant region attached to a solid phase (see Khrapko p. 383, Fig. 8 "'TCGTTTT") and a variable region (see Khrapko Fig. 8, the 5' end of the constant region, replaced with "G," "CG" or "C").

The claims recite various specific types of labels and solid phases. It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to use any labels or solid phase because, as taught by Khrapko (see Khrapko for example p. 385, section entitled "CSH,"), only the interaction between the probe and the target sequence is critical to the function of the method. Thus, the ordinary artisan would have reasonably expected any labels or solid phase material to function in the claimed invention.

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Drmanac teaches the use probes of 11-20 (see Drmanac p. 527, paragraph bridging col. 1 and 2) and Khrapko teaches random regions of 1 and 2 (see above) and Drmanac teaches 3 random positions (see Drmanac p. 530, Fig. 2a "NNCATGAGTTN"). It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to use a variable region of any size for the expected benefit of detecting as many target sequences as possible. The bigger the array of variable sequences, the more targets can be identified and therefore the more useful the array will be. The variable region size will be limited only by the expense and size of the resulting array.

The claims differ from Khrapko in the recitation of identification and detection steps. However, Drmanac teaches a method of nucleic acid detection or identification comprising contacting the a nucleic acid with a sample bound to a solid phase (see, for example, Drmanac p. 532, Figs. 4 and 5). It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to use the materials of Khrapko in the method of Drmanac because the methods of Drmanac increase the discrimination of detection methods, an advantage explicitly taught as desirable in Drmanac (see Drmanac p. 527, col. 1, for example).

3. Papers relating to this application may be submitted to Group 180 by facsimile transmission. Papers should be faxed to Art Unit 1809. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Art Unit 1809 Fax number is (703) 305-7401.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott Houtteman whose telephone number is (703) 308-3885. The examiner can normally be reached on Tuesday-Friday from 8:30 AM - 6:00 PM. The examiner can also be reached on alternate Mondays.

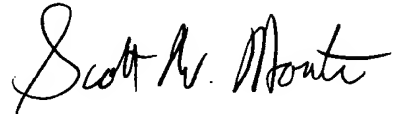
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, George Elliott, can be reached at (703) 308-4003.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0196.

Scott Houtteman
October 2, 2000

A handwritten signature in cursive script, reading "Scott W. Houtteman".

SCOTT W. HOUTTEMAN
PRIMARY EXAMINER